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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/728,666	12/05/2003	Thilaka S. Sumanaweera	2003P13288US	1282

7590 11/10/2005

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EXAMINER	
TUNG, KEE M	
ART UNIT	**PAPER NUMBER**
2671	

DATE MAILED: 11/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/728,666	SUMANAWEERA ET AL.	
	Examiner	Art Unit	
	Kee M. Tung	2671	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 September 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) *16-34* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

This application contains claims 16-34 drawn to an invention nonelected without traverse in reply filed on 2/10/05. A complete reply to this rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-6, 8-11 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scheib et al (5,682,896 hereinafter "Scheib") in view of Schimpf et al (6,784,894 hereinafter "Schimpf").

Scheib teaches a graphics processing unit system (Fig. 1) for diagnostic medical ultrasound imaging, comprising a graphics processing unit (105) having an input (connects to RF processor 103 and system bus 120 and Doppler processor 106) and at least one output (connects to video processor 127), the graphics processing unit operable to process first ultrasound data from the input (received from transmitter receiver 102) and a processor (127) connected with the at least one output, the processor operable to process second ultrasound data output on the at least one output of the graphics processing unit. However, Scheib fails to explicitly teach the graphics

processing unit having at least one of a vertex processor and a fragment processor. These are what Schimpf teaches. Schimpf teaches a graphics accelerator/system (112) comprising a media processor (14); a hardware accelerator (18), a frame buffer (22), a video output processor (24) and a video encoder (28). The hardware accelerator (18) further includes at least a vertex processor (162), render pipeline 166, sample generator 174, texture environment 180 and a fragment processor 184. It would have been obvious to one of ordinary skill in the art at the time the present invention was made to combine the detailed teachings of graphics processor of Schimpf into system of Scheib in order to replace the graphics processor in order to provide and high performance graphics system and thus to generate a high quality graphics output for medical ultrasound system and therefore, provide clear image for diagnosis. Therefore, at least claims 1, 2, and 4-6 would have been obvious.

As per claim 3, the combined system fails to explicitly suggest that the at least one output is downstream from the vertex processor and upstream from the fragment processor. However, Schimpf teaches or suggests that you can have an intermediate stage or output between the first and last states of the pipeline for additional or further processing. Therefore, It would have been obvious to one of ordinary skill in the art at the time the present invention was made to modify the teachings of Schimpf as claimed in order to provide additional process capability and further increase the speed of processing and generating the processed output.

As per claim 8, Schimpf teaches the vertex processor is operable to perform a scan conversion operation (col. 10, lines 19-63).

As per claim 9, the combined system fails to explicitly suggest or teach the fragment processor is operable to perform one of a Fourier transform and a non-linear scan conversion operation. However, these features are considered well known and well used in the graphics art that the graphics processor performs these functions. Therefore, It would have been obvious to one of ordinary skill in the art at the time the present invention was made to modify the teachings of Scheib and Schimpf to include the features into the graphics processor (fragment processor is a part of the graphics processor) and performing by the fragment processor and thus to increase the performance of the graphics system.

Claims 10, 11 and 13-15 are similar in scope to claims 1, 6, 8 and 9, and thus are rejected under similar rationale.

3. Claims 7 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scheib et al (5,682,896 hereinafter "Scheib") in view of Schimpf et al (6,784,894 hereinafter "Schimpf") as applied to claims 1 and 10 above, and further in view of Pan et al (6,464,641 hereinafter "Pan").

The teachings of Scheib and Schimpf are given in previous paragraph of this Office action. However, Scheib fails to explicitly teach or suggest an ultrasound data path beginning at a beamformer. This is what Pan teaches. Pan teaches an ultrasound imaging system (Fig. 1) comprising a beamformer board (4) for transmit and receive beamforming, a color flow processor 6, a B mode processor 8, a spectral Doppler processor 10, a scan converter 12, graphics processor 24, a video processor 14, a timeline display memory 18, a host computer 20 and a display device 16. It would have

been obvious to one of ordinary skill in the art at the time the present invention was made to combine the teachings of beamformer of Pan into the combined system of Scheib and Schimpf in order to transmit and receive the ultrasound signal and generate I (in-phase) and Q (quadrature) data signal for further processing by the later stage as the ultrasound data output as taught by Pan (col. 3, lines 10-33). Therefore, at least claims 7 and 12 would have been obvious.

Response to Arguments

4. Applicant's arguments filed 9/6/05 have been fully considered but they are not persuasive.

Basically, applicant argues that if a person of ordinary skill in the art had used the graphics system of Schimpf for the graphics processor of Scheib, the video processor of Scheib would have been included in the graphics system and not a separate component. Well, it is not the graphics system 112 of Schimpf for the graphics processor of Scheib, it is the hardware accelerator 18 of the graphics system 112 of Schimpf in place of the graphics processor 105 of Scheib. Schimpf further teaches the graphics system 112 can be an single chip integrated circuit (col. 5, lines 29-30).

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kee M. Tung whose telephone number is 571-272-7794. The examiner can normally be reached on Tuesday - Friday from 5:30 am - 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka Chauhan can be reached on 571-272-7782. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Kee M Tung
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Art Unit 2671